

# 2016 BCS Disease Detectives Test – Answer Keys

## 1. Match the following. (1 point each-10 points)

1. D. Epidemic
2. F. Outbreak
3. A. Clinical Trial
4. J. Case Control
5. H. Cohort
6. B. Cluster
7. C Quarantine
8. I Chain of Infection
9. G Incubation period
10. E. Vehicle

## 2. Ten steps of investigating an outbreak (5 points) -please grade leniently. order may vary , 0.5 points for each step

1. Identify resources/prepare for field work/establish investigation team
2. Establish existence of outbreak
3. Verify the diagnosis
4. Define the case
5. Identify and count cases
6. Perform descriptive epidemiology
7. Develop hypothesis
8. Evaluate hypothesis/Reconsider and refine hypothesis/perform more studies
9. Implement control
10. Communicate findings
11. (In case previous where combined) Maintain Surveillance

## 3. Types of Study (2 points each, 10 points)

- (i) C
- (ii) A
- (iii) B
- (iv) B
- (v) A

## 4. Interpretation of Epidemic Curve (10 points-4 points for A as has two parts)

- A. October 28th, November 18th
- B. November 4th
- C. Point source
- D. October 28th minus 2 weeks October 14th.

## 5. (2 points each, 10 points)

- (i) c
- (ii) c
- (iii) b
- (iv) a
- (v) c

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## 6. Eating Fish Study

A. Cohort study (2 points)

B. (6 Points)

Eating Fish	Cases of Stroke	No Stroke
Never	82 ( <i>b</i> )	1,549
Almost daily	23	779

$$RR = \text{incidence in exposed} / \text{incidence in unexposed} = 1.75$$

C. Those who eat never eat fish are 1.75 times more likely to develop stroke compared to those who eat fish almost daily. (4 points)

## 7. Case Study 1: Cholera outbreak in Parbatia, India

1. Yes, it is an outbreak, The incidence in the primary health centre area in November 2003 was higher than that in the rest of the district and higher than that in the same area during the previous years. (2 points)

2. occurrence of more than three watery stools a day among residents of the parbatia village, Orissa in November 2003. (2 points)

3.. Vibrio cholera, norwalk virus, rotavirus, salmonella, shigella, E.coli, Campylobacter,(2 points) (answers can vary-do not give points if the students just write bacteria, virus parasite, protozoa etc (4 points)

4. Attack rates of cholera by age and sex, Parbatia, Orissa, India, 2003 (10 points)

		Number of cases	Population	Incidence
Age group (In years)	0 to4	6	113	5.30%
	5 to14	4	190	2.10%
	15 to24	5	128	3.90%
	25 to34	5	144	3.50%
	35 to44	6	129	4.70%
	45 to54	4	88	4.50%
	55 to64	8	67	11.90%
	> 65	3	87	3.40%
Sex	Male	17	481	3.50%
	Female	24	465	5.20%
Total	Total	41	946	4.30%

5. The attack rates were higher in those aged 55-64 years and slightly higher in females compared to males. (2 points)

6. Common source Epidemic. (2 points)

7. C. unprotected well. (2 point)

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### 8. 6points

Students have to be accurate and descriptive in the table. No points if relative risk is calculated

	<b>Cholera (cases)</b>	<b>Controls</b>	<b>Total</b>
<b>Drunk well water</b>	28	23	51
<b>Did not drink well water</b>	12	57	69
<b>Total</b>	40	80	120

Odds Ratio 5.7

9. People who drank well water were 5.7 times more likely(had 5.7 times odds of) to develop cholera as opposed to those who did not drink well water. **(4 Points)**

10. To avoid effect of confounding variables (2 points)

11. Matching, stratification, randomization, restriction ( Students can mention any two- 2 points)

### 8. Case Study 2

1. **(3 points** — 1 each for explanation of numerator, denominator, and time)

Incidence rate is a measure of the frequency with which a health problem or health event (such as a new injury or case of illness) occurs in a population. In calculating incidence, the numerator is the number of new cases occurring in the population during a given period of time, and the denominator is the total population at risk during that time.

2. **(8 points** — 2 for each rate. Estimates are acceptable; however, units must be cited. Take off 1 point for each rate without units.)

**White Men** 19.3 per 100,000 persons

**White Women** 13.6 per 100,000 persons

**Black Men** 1.1 per 100,000 persons

**Black Women** 1.0 per 100,000 persons

3. Explanations can vary **(4 points)**

Racial and ethnic differences in observed rates are mostly due to skin color, which is determined by the amount of melanin produced by skin cells called melanocytes.

Melanin also protects the skin from damage by UV radiation. Although darkly pigmented people (e.g., African-Americans, Asians, Hispanics) develop skin cancer on sun-exposed sites at lower rates than lightly pigmented people, UV exposure still increases their risk of skin cancer.

- Different cultures may have different prevention behaviors.
- Exposure may tend to be longer and more intense in some cultures than in others.
  - Diagnosis may be more difficult when skin is highly pigmented.

4. Cross sectional/ survey. **(2 points)**

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5. (3 points — 1 each for indication of numerator, denominator, and time)

Prevalence is the rate, or proportion, of people in a population at a given time who have a certain disease, chronic condition, injury, or attribute. We can calculate prevalence at a particular point in time (point prevalence) or during a specified period of time (period prevalence).

6. 13.3% of students reported frequent sunscreen use when they are outside for more than one hour on a sunny day. (2 points)

7. (3 points — 1 for each characteristic)

Give credit for

- “Older” or “age  $\geq 18$ ” (no credit for grade)
- Black
- Male

8. (4 points) use of hats, wearing long sleeved shirts, limiting exposure to sun/outdoor activities -answers may vary